TITLE

HYDRAULIC ELEVATOR REPAIR SAFETY PLATFORM

FIELD OF THE INVENTION

The present invention relates to an elevator safety platform and more particularly to a safety platform for hydraulic elevator repair.

BACKGROUND OF THE INVENTION

A hydraulic type elevator is operated by a hydraulic system including a jack assembly, a piston assembly, and a network of oil lines. Repairing one of the above components of the hydraulic elevator often requires an elevator mechanic or building maintenance personnel to enter a hoistway under an elevator car while conducting the repairs. Persons that enter the hoistway may suffer serious or fatal accidents if the elevator car moves unexpectedly. Such accidents commonly occur in a pit where the person is crushed by the unexpected movement of the elevator car.

A safety system commonly employed to prevent such accidents is the use of a safety switch located in the elevator car. The mechanic typically will enter the elevator car while parked at a specified floor and manually transfer the switch from a normal mode to an inspection mode. Such a system is ineffective in a hydraulic elevator if there is a rupture in one of the components causing a loss of hydraulic fluid.

It would be desirable to produce a hydraulic elevator repair safety platform for use in elevator hoistways of varying dimensions which militates against vertical movement of an elevator car during repair of the elevator.

SUMMARY OF THE INVENTION

Consistent and consonant with the present invention, a hydraulic elevator repair safety platform for use in elevator hoistways of varying dimensions which militates against vertical movement of an elevator car during repair of the elevator, has surprisingly been discovered.

The hydraulic elevator repair safety platform comprises an elongate central beam having a first end and a second end, the beam adapted to be connected to an elevator car; a guide clamp assembly connected to the beam and adapted to be received by an elevator guide rail system, the guide clamp assembly having an actuation arm actuated by a downward movement of the elevator car, whereby the actuation of the actuation arm causes the guide clamp assembly to grip the guide rail system which facilitates immobilization of the elevator car.

BRIEF DESCRIPTION OF THE DRAWINGS

The above, as well as other objects, features, and advantages of the present invention will be understood from the detailed description of the preferred embodiments of the present invention with reference to the accompanying drawings, in which:

Fig. 1 is a front elevation view of a hydraulic elevator repair safety platform incorporating the features of the invention and schematically showing a portion of an elevator car;

Fig. 2 is a side elevation view showing an end portion of the hydraulic elevator repair safety platform illustrated in Fig. 1;

Fig. 3 is a top plan view of the end portion of the hydraulic elevator repair safety platform illustrated in Fig. 2;

Fig. 4 is a front elevation view showing a central beam of the hydraulic elevator repair safety platform illustrated in Fig. 1; and

Fig. 5 is a side elevation view of the central beam portion illustrated in Fig. 4.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and particularly Fig. 1, there is shown generally at **10** a hydraulic elevator repair safety platform incorporating the features of the invention. The safety platform **10** includes an elongate central beam **12**. In the embodiment shown, a pair of spaced apart steel channel sections comprise the central beam **12**, as clearly shown in Fig. 5. It is understood that other beam structures such as a single beam, for example, could be used without departing from the scope and spirit

of the invention. A plurality of rigging members **14** depend from the channel sections of the central beam **12**. As shown in Figs. 1, 4, and 5, the rigging members **14** include pairs of U-bolts **14a** with each U-bolt of a pair attached to an associated one of the channel sections. A length of piping or rod **14b** extends between the U-bolts of each pair and is held therein to maintain the spaced relationship of the channel sections. A plurality of holes **16** are disposed at each end of each of the channel sections of the central beam **12**.

Each end of the central beam **12** has an end portion **18** connected thereto. A plurality of holes **20** are formed in the end portions **18**, and can be selectively aligned with the holes **16** of the central beam **12** to receive fasteners (not shown) and to facilitate an adjustment of the overall length of the safety platform **10**. In the embodiment shown, a pair of spaced apart steel channel sections **18a** comprise the sides of the end portions **18**, as clearly shown in Fig. 2. The channel sections **18a** are connected by top and bottom plates **18b** attached by suitable fasteners. It is understood that other end portion structures could be used without departing from the scope and spirit of the invention. A slot **22** is formed in one end of each of the plates **18b** of the end portions **18**, as illustrated in Figs. 2 and 3. The slots **22** of the end portions **18** receive an elevator guide rail **24** therein as shown in Fig. 3. The guide rail **24** is attached to a wall of an elevator hoistway (not shown). In the embodiment shown, the guide rail **24** is a T-rail with the stem received in the slot **22**. It is understood that other guide rails could be used without departing from the scope and spirit of the invention.

An upwardly extending adapter guide shoe plate **26** is disposed on the top one of the plates **18b** of each of the end portions **18**. The guide shoe plates **26** are adapted to be connected to an elevator car **27**. The connection may be achieved by removing roller/slide guides (not shown) from the underside of the elevator car **27** and attaching the guide shoe plates **26** to the elevator car **27** at the point where the roller/slide guides were removed.

As shown in Fig. 1, a guide clamp assembly **29** is connected to the safety platform **10** on the end portions **18**. The guide clamp assembly **29** includes a pair of guide clamps **28**, an adjustable guide clamp linkage **30**, and a safety cable **32**. Such a

guide clamp assembly **29** can be purchased as an assembly commercially available as a Type "A" Instantaneous Model 540 Safety from Hollister Whitney, for example. The safety cable **32** is typically connected to a ceiling or a wall of the elevator hoistway. The safety cable **32** is also connected to one of the actuating arms **34** and through the linkage **30** to the other one of the arms **34**. Each of the actuating arms **34** is connected to a clamping system (not shown) within the associated guide clamp **28** which cooperates to act as a brake. The linkage **30** facilitates simultaneous actuation of the actuating arms **34**. A slot **36** formed in the guide clamp **28**, as illustrated in Fig. 2, receives the guide rail **24** therein.

A pair of guide shoes **38** are connected to each of the guide clamps **28**. A gap or space **40** is formed between the guide shoes **38** to receive the guide rail **24** therein, as shown in Fig. 2. Such a guide shoe **38** can be purchased such as is commercially available as Model No. 371 Guide Shoe from Hollister Whitney, for example.

When repair or maintenance of a hydraulic elevator is necessary, the elevator car **27** can be positioned as desired. The safety platform **10** is then attached to the underside of the elevator car **27** using the guide shoe plates **26**. Adjustment of the overall length of the safety platform **10** is accomplished by aligning the apertures **16** of the central beam **12** with the holes **20** of the end portions **18** and bolting the central beam **12** to the end portions **18** to achieve the desired length.

The safety cable **32** is then connected to the wall or the ceiling of the elevator hoistway. The elevator car **27** is caused to move downwardly, thereby tensioning the safety cable **32** and causing actuation of the actuating arms **34**. The guide clamp linkage **30** facilitates simultaneous actuation of the actuating arms **34**. The clamping system within the guide clamps **28** is caused to grip the guide rail **24** with the guide shoes **38**, thus causing the downward movement of the elevator car **27** to stop. Further downward movement of the elevator car **27** will cause the clamping system within the guide clamps **28** to more tightly grip the guide rail **24**, thus immobilizing the elevator car **27** within the elevator hoistway. The guide shoes **38** maintain proper alignment of the guide clamps **28** and entire safety platform **10** during the use of the safety platform **10** during the repair or maintenance operation.

Once the elevator car **27** is immobilized, an elevator mechanic or building maintenance personnel can safely conduct the repair or maintenance. The rigging members **14** provide a point for connection of a hoist or other tools which will facilitate removal of a jack assembly or other hydraulic elevator components.

When the desired repair or maintenance operation has been completed, the safety platform **10** can be removed and the elevator car **27** returned to normal operation.

From the foregoing description, one ordinarily skilled in the art can easily ascertain the essential characteristics of this invention and, without departing from the spirit and scope thereof, can make various changes and modifications to the invention to adapt it to various usages and conditions.